Digging/Trenching/Excavations
ACTIVITY HAZARDS ANALYSIS
Hydrologic Engineering Branch

ACTIVITY: Digging/Trenching/Excavations
ANALYZED BY/DATE: Frank Lovejoy, 9/07/01 REVIEWEDBY/DATE: Larry Janis, 9/10/01

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
General operations – Planning, Inspections, & Testing Protective Systems – Stability of Adjacent Structures, Protection from water, Protection from Falling Materials	Bodily injury or death	Planning 1. Call diggers hotline of NE (402) 344-3565 2. Prior to opening an excavation, underground installations shall be located and protected from damage or displacement: utility companies and other responsible authorities shall be contacted to locate and mark the locations and, if they so desire, direct or assist with the protecting the underground installations Excavation Inspections and Testing 3. When persons will be in or around excavations: the excavation, the adjacent areas, the protective systems shall be inspected daily, as needed throughout work shifts 4. If evidence of a situation which could result in possible cave-ins, slides, failure of protective systems, hazardous atmospheres, or other hazardous condition is identified, exposed workers shall be removed from the hazard and all work in the excavation stopped until all necessary safety precautions have been implemented 5. In locations where oxygen deficiency or gaseous conditions are known or suspected, air in the excavation shall be tested prior tot he start of each shift or more often if directed by the designated authority: a log of all test results shall be maintained at the work site Protective Systems 6. The sides of all excavations in which employees are exposed to danger from moving ground shall be guarded by a support system, sloping or benching of the ground, or other equivalent means 7. Excavations less than 5 ft in depth and which a competent person examines and determines there to be no potential for cave-in do not require protective systems Stability of Adjacent Structures 8. Except in stable rock, excavations below the level of the base of footing of any foundation or retaining wall shall not be permitted unless: a. A support system, such as underpinning, is provided to ensure the stability of the structure and to protect employees involved in the excavation work or in the vicinity thereof b. A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation and that the excavation will not pose a hazard to employees 9. If the stability of adjoining buildings or walls is

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		endangered by excavations, shoring, bracing, or underpinning designed by a qualified person shall be provided to ensure the stability of the structure and to protect employees 10. Sidewalks, pavements, and related structures shall not be undermined unless a support system is provided to protect employees and the sidewalk, pavement, or related structure 11. Where it is necessary to undercut the side of an excavation, overhanging material shall be safely supported Protection from Water 12. Diversion ditches, dikes, or other means shall be used to prevent surface water entering an excavation and to provide good drainage of the area adjacent to the excavation 13. Employees shall not work in excavations in which there is accumulated water or in which water is accumulating unless the water hazards posed by accumulation in controlled a. Freezing, pumping, drainage, and similar control measures shall be planned and directed by a competent engineer: consideration shall be given to the existing moisture balances in surrounding soils and the effects on foundations and structures if it is disturbed b. When continuous operation of ground water control equipment is necessary, an emergency power source shall be provided: water control equipment and operations shall be monitored by a competent person to ensure proper operation Protection from Falling Material 14. Employees shall be protected (by scaling, ice removal, benching, barricading, rock bolting, wire mesh, or other means) from loose rock or soil which could create a hazard by falling from the excavation wall: special attention shall be given to slopes which may be adversely affected by weather, moisture content, or vibration 15. Materials, such as boulders or stumps, that may slide or roll into the excavation shall be removed or made safe 16. Excavated materials shall be placed at least 2 ft from the edge of an excavation or shall be retained by devices which are sufficient to prevent the materials from falling into the excavation: in any case, material shall be placed at a distance to prevent excessive loading on the face of the excavation Mobile Equipment and Motor Vehicle Precautions 17. Mobile equipment and motor vehicle precautions

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		a. When vehicles or mobile equipment are utilized or allowed adjacent to an excavation, substantial stop logs or barricades shall be installed: the use of a ground guide is recommended b. Workers shall stand away from vehicles being loaded or unloaded to avoid being struck by spillage or falling materials c. Excavating or hoisting equipment shall not be allowed to raise, lower, or swing loads over personnel in the excavation without substantial overhead protection 18. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at lower levels are adequately protected from the hazard of falling material or equipment 19. When operations approach the location of underground utilities, excavation shall progress with caution until the exact location of the utility is determined: workers shall be protected from the utility and the utility from damage or displacement 20. Employees entering excavations classified as confined spaces or which otherwise present the potential for emergency rescue shall wear a harness with a life-line securely attached to it
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
1. Shovels, Spades, Tile Shovels 2. Trenchers	See recommended controls	1. Most of the trench is done by hand, usually no deeper than 12 to 18 inches. Therefore safe work practices need to be learned. 2. Most trenchers as used for trenched up to 3 foot. See recommended controls, number 7, for requirements.